

Claims

- [c1] 1.A gradient coil assembly for a magnetic resonance imaging system comprising:
at least two coils, the coils comprising:
at least one conductor mechanically bonded via a non-conducting substrate; and
wherein a bonding surface of the at least one conductor has been subjected to a surface treatment to improve the mechanical bonding properties of the bonding surface.
- [c2] 2.The gradient coil assembly of claim 1, wherein the surface treatment provides a surface of microscopic dendritic structures to the bonding surface of the at least one conductor.
- [c3] 3.The gradient coil assembly of claim 1, wherein the surface treatment provides a black oxide coating on the bonding surface of the at least one conductor.
- [c4] 4.The gradient coil assembly of claim 1, wherein the surface treatment provides a red oxide coating on the bonding surface of the at least one conductor.
- [c5] 5.The gradient coil assembly of claim 1, wherein the surface treatment provides a brown oxide coating on the

bonding surface of the at least one conductor.

[c6] 6.The gradient coil assembly of claim 1, wherein the at least one conductor is a copper conductor.

[c7] 7.The gradient coil assembly of claim 1, wherein the at least one conductor is a saddle coil.

[c8] 8.The gradient coil assembly of claim 1, wherein the at least one conductor is mechanically bonded to at least one coil.

[c9] 9.A magnetic imaging system comprising:
a system controller;
a gradient amplifier unit in operable communication with the system controller;
a magnetic assembly in operable communication with the gradient amplifier, the magnetic assembly comprising:
a gradient coil assembly comprising at least two coils, the coils comprising:
at least one conductor mechanically bonded via a non-conducting substrate; and
wherein a bonding surface of the at least one conductor has been subjected to a surface treatment to improve the mechanical bonding properties of the bonding surface.

[c10] 10.The magnetic imaging system of claim 9, wherein the

surface treatment provides a surface of microscopic dendritic structures to the bonding surface of the at least one conductor.

[c11] 11.The magnetic imaging system of claim 9, wherein the surface treatment provides a black oxide coating on the bonding surface of the at least one conductor.

[c12] 12.The magnetic imaging system of claim 9, wherein the surface treatment provides a red oxide coating on the bonding surface of the at least one conductor.

[c13] 13.The magnetic imaging system of claim 9, wherein the surface treatment provides a brown oxide coating on the bonding surface of the at least one conductor.

[c14] 14.The magnetic imaging system of claim 9, wherein the at least one conductor is a copper conductor.

[c15] 15.The magnetic imaging system of claim 9, wherein the at least one conductor is a saddle coil.

[c16] 16.The magnetic imaging system of claim 9, wherein the at least one conductor is mechanically bonded to at least one coil.

[c17] 17.A method for assembling a gradient coil assembly, the method comprising:
treating a bonding surface of at least one conductor; and

bonding the at least one conductor to a nonconducting substrate.

[c18] 18.The method for assembling a gradient coil assembly of claim 17, wherein the treating of a bonding surface provides a surface of microscopic dendritic structures to the bonding surface of the at least one conductor.

[c19] 19.The method for assembling a gradient coil assembly of claim 17, wherein the treating of a bonding surface provides a black oxide coating on the bonding surface of the at least one conductor.

[c20] 20.The method for assembling a gradient coil assembly of claim 17, wherein the treating of a bonding surface provides a red oxide coating on the bonding surface of the at least one conductor.

[c21] 21. The method for assembling a gradient coil assembly of claim 17, wherein the treating of a bonding surface provides a brown oxide coating on the bonding surface of the at least one conductor.